



Empowering Teachers Through AI-Integrated Pronunciation Training with Google AI Studio: A Community Service Program at SMPN 1 Jongkat, Mempawah Regency

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Abstract: The integration of artificial intelligence in English language teaching faces implementation challenges despite documented benefits, particularly in resource-limited Indonesian contexts where teachers' digital competence significantly influences adoption. This community service program addressed these gaps through comprehensive technology integration training focused on Google AI Studio for pronunciation instruction at SMPN 1 Jongkat, Mempawah Regency. The program employed a participatory approach combining needs analysis, hands-on training, collaborative workshops, and systematic evaluation involving 19 teachers. Post-training surveys using 5-point Likert scales assessed confidence levels across multiple dimensions of AI-assisted pronunciation instruction. Results demonstrated consistently high confidence levels across most dimensions, with means ranging from 4.26 to 4.74, particularly in using AI-generated speech for listening input and designing speaking activities. However, teachers showed notably lower confidence in self-assessment applications, revealing hesitation in comparing their own pronunciation with AI-generated models. The majority of participants prioritized ease of material development as the primary advantage. Analysis through the Technological Pedagogical Content Knowledge framework indicated successful development of integrated technical and pedagogical competence, though limited articulation of specific implementation strategies suggests need for ongoing professional support. The training successfully established foundational confidence for AI integration while identifying areas requiring continued development to ensure sustainable implementation.

Keywords: Artificial Intelligence, Technology Integration, Teacher Professional Development, Pronunciation Instruction, Digital Competence.

Introduction

The integration of artificial intelligence (AI) in English language teaching has emerged as a transformative approach to address persistent challenges in pronunciation instruction, particularly in resource-limited educational contexts. Recent studies demonstrate that AI-powered speech recognition technology significantly enhances learners' pronunciation skills by providing consistent, accurate

pronunciation models and immediate feedback (Sarwadi, 2025). Research examining AI-based speech recognition technology in Indonesian contexts shows that students using these tools achieve substantial improvements in pronunciation compared to conventional teaching methods. AI tools support various language-specific skills including correcting English pronunciation, facilitating repetitive practice, and providing automatic marking and feedback (Dja'far & Hamidah, 2024).

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Despite the documented potential of AI technologies for language instruction, their effective implementation remains heavily dependent on teachers' digital competence and pedagogical readiness. Systematic reviews of teacher professional development programs indicate that effective technology integration requires collaborative learning environments, hands-on digital training, ongoing mentorship, and institutional support. Studies show that professional development exposure influences not only teachers' technical abilities but also their value beliefs toward instructional technology use, both of which are critical determinants of implementation quality (Cheng et al., 2020; Liu et al., 2015).

However, effective implementation depends heavily on teachers' digital competence and pedagogical readiness. Systematic reviews indicate that successful technology integration requires collaborative learning environments, hands-on training, ongoing mentorship, and institutional support (Cheng et al., 2020; Fütterer et al., 2024). In Indonesia specifically, inadequate support for digital learning transition poses significant challenges, accentuated by poor formative training and limited pre-existing digital literacy skills. Reports indicate that suboptimal digital literacy among Indonesian educators stems from low knowledge of digital devices, insufficient guidance, and inadequate technology-integrated training (Zulaikha et al., 2025). Many Indonesian English teachers, having learned English with limited native speaker exposure, may harbor concerns about their own pronunciation accuracy, making AI-generated speech models particularly valuable yet requiring careful professional development approaches.

The Technological Pedagogical Content Knowledge (TPACK) framework emphasizes that effective technology integration occurs when teachers meaningfully synthesize technology, pedagogy, and content knowledge (Koehler & Mishra, 2009). Professional learning communities are critical for sustained integration, providing ongoing support and collaborative problem-solving (Voogt et al., 2013). Previous research has examined AI tools for pronunciation practice, including ELSA Speak (Aryanti & Santosa, 2024), Google Read Along (Abimanto, 2020), and AI chatbots (Ding & Zou, 2024). Chen et al. (2016) demonstrated that visual pitch representations in AI systems support pronunciation learning. However, most studies focus on student outcomes rather than teacher development processes. Limited research investigates how teachers' confidence develops during technology integration training, particularly in Indonesian junior high school contexts where teachers face challenges related to large classes, limited resources, and diverse proficiency levels.

This community service program addresses these gaps by implementing comprehensive technology integration training focused on Google AI Studio for pronunciation instruction at SMPN 1 Jongkat, Mempawah Regency. The program adopted a participatory approach combining needs analysis, hands-on training, collaborative workshops, and systematic evaluation. The objectives were: (1) to introduce teachers to AI-powered pronunciation instruction tools, (2) to develop practical skills in using Google AI Studio for creating learning materials, (3) to assess teachers' confidence levels across AI-assisted teaching dimensions, and (4) to identify teachers' perceptions of advantages and applications. By examining post-training confidence levels, perceived applications, and identified advantages, this study contributes empirical evidence regarding participatory professional development effectiveness for AI technology integration in Indonesian contexts, informing future initiatives and supporting sustainable technology integration in resource-limited settings.

Method

The implementation of this community service program was organized in several stages using a participatory and collaborative approach to optimize the synergy between the Postgraduate Program of the Faculty of Teacher Training and Education (FKIP) at Tanjungpura University and the teachers of SMPN 1 Jongkat, Mempawah Regency. The stages of implementation are as follows:

1. Introduction to the Postgraduate Program of FKIP Universitas Tanjungpura

The activity began with an introduction session to the FKIP Universitas Tanjungpura Postgraduate Program. This session presented the profiles of the Master's and Doctoral Programs in Education, the vision and mission of the faculty, and its research and development focuses. The aim was to build initial understanding and establish collaboration between the university and partner schools.

2. Training and Technology Integration Workshop

Based on the identified needs, a workshop was held focusing on the integration of technology in teaching and learning. Teachers were introduced to various digital tools and learning platforms that could enhance classroom engagement, creativity, and efficiency. Practical sessions allowed teachers to design lesson plans incorporating these technologies.

3. Needs Analysis through Survey

A needs analysis was conducted through questionnaires or angket involving teachers and the principal of SMPN 1 Jongkat. This stage aimed to

identify teachers' digital literacy levels, challenges in integrating technology into teaching, and their expectations for professional development.

4. Evaluation and Reflection

After the training and workshop sessions, an evaluation was carried out through an open forum and short questionnaire to collect participants' feedback, impressions, and suggestions. This stage aimed to measure the effectiveness of the program and participants' level of understanding regarding technology integration in education.

5. Formulation of Follow-up Action Plans

The final stage involved the preparation of follow-up action plans based on the evaluation results. These plans included proposals for continuous mentoring, future training activities, collaborative classroom projects, and opportunities for further cooperation between FKIP Universitas Tanjungpura and SMPN 1 Jongkat.

This community service program activity was organized by the community service team from the Master of Educational Technology Program, Faculty of Teacher Training and Education, Universitas Tanjungpura and also Universiti Teknologi MARA Malaysia. The program was held at SMPN 1 Jongkat, Mempawah Regency, and attended by 19 teachers and the principal. The participants came from various teaching backgrounds and demonstrated high enthusiasm and dedication to improving their teaching competence through technology integration.

Result and Discussion

The community service program was attended by 19 English teachers from SMPN 1 Jongkat, Mempawah Regency. All participants completed a post-training survey to assess their confidence levels in integrating AI technology, specifically Google AI Studio, into their English language teaching practice.

Teachers' Confidence in AI-Integrated Pronunciation Teaching

The survey employed a 5-point Likert scale (1 = Not Confident, 5 = Very Confident) to measure teachers' perceived competence across multiple dimensions of AI-assisted pronunciation instruction. Table 1 presents the descriptive statistics of teachers' confidence levels.

Based on Table 1, the highest confidence levels emerged in using AI speech as listening input (M = 4.74) and designing speaking activities with AI-generated speech (M = 4.63), indicating strong readiness for practical classroom implementation. However, teachers showed notably lower confidence (M = 3.68) in comparing their own pronunciation with AI-generated speech, revealing hesitation in using AI for professional

self-assessment despite high confidence in student-focused applications.

Perceived Applications and Advantages. When asked how they would use Google AI Studio in teaching, the majority of teachers (84.2%, n=16) expressed intention to incorporate it as regular teaching media, while smaller numbers mentioned specific applications for pronunciation practice (10.5%, n=2) and oral practice (5.3%, n=1). Regarding advantages, Table 2 shows that ease of material development dominated teachers' perceptions.

Table 1. Teachers' Confidence in Using AI for Pronunciation Teaching (N=19)

Indicator	Mean	Mode	Level
Using AI-generated speech for correct pronunciation	4.47	5	High
Self-comparison with AI-generated speech	3.68	4	Moderate-High
Demonstrating natural English intonation	4.26	4	High
Teaching pauses and stress patterns	4.58	5	Very High
Teaching rhythm and emphasis	4.58	5	Very High
Designing speaking activities with AI	4.63	5	Very High
Using AI speech as listening input	4.74	5	Very High
Facilitating student self-comparison	4.42	4	High
Integrating AI into role-plays and dialogues	4.42	4	High



Figure 1. Documentation of Activity

Table 2. Perceived Advantages of Google AI Studio (N=19)

Category	Frequency	Percentage
Ease of module/material development	15	78.9%
Enhanced teaching design	1	5.3%
Simplified learning process	1	5.3%
Prosodic features instruction	1	5.3%
General usefulness	1	5.3%

Successful Training Implementation and High Confidence Levels

The consistently high confidence levels ($M = 4.26$ to 4.74) across most dimensions demonstrate that the training successfully equipped teachers with both technical competence and pedagogical confidence. This aligns with Koehler and Mishra's (2009) Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes that effective technology integration requires not merely technical skills but the ability to meaningfully combine technology, pedagogy, and content knowledge. The participatory workshop approach, which provided hands-on experience with Google AI Studio, enabled teachers to develop this integrated understanding rather than viewing technology as separate from their teaching practice. The particularly high confidence in using AI for listening input and speaking activities suggests teachers successfully transferred existing pedagogical knowledge to new technological contexts. As Ertmer and Ottenbreit-Leftwich (2010) note, teachers are more likely to adopt technologies that align with familiar instructional practices rather than requiring complete pedagogical restructuring. AI-generated speech represents a flexible alternative to traditional audio materials, making adoption feel achievable rather than overwhelming.

The Self-Assessment Gap and Professional Identity

The notably lower confidence in self-assessment with AI ($M = 3.68$) reveals an important paradox: teachers felt capable of facilitating student use of AI but experienced hesitation when applying the same process to themselves. This finding resonates with Borg's (2015) research on language teacher cognition, which highlights how teachers' beliefs about their own linguistic competence significantly influence their instructional decisions. Many non-native English teachers harbor private concerns about pronunciation accuracy, and using AI for explicit self-comparison may make these concerns uncomfortably visible.

This gap suggests that future professional development should explicitly address teacher self-assessment by creating supportive frameworks that normalize pronunciation improvement as ongoing professional growth rather than evidence of inadequacy. As Farrell (2015) argues, reflective practice requires safe environments where teachers can examine their practice without fear of judgment. Training should include modeling of constructive self-assessment techniques and emphasize

that AI serves as a developmental tool rather than a replacement for teacher expertise.

Efficiency as Primary Motivator

The finding that 78.9% of teachers prioritized ease of material development as Google AI Studio's primary advantage reflects genuine relief from chronic workload pressures. In resource-limited contexts like Indonesian junior high schools, creating quality pronunciation materials traditionally requires extensive time and effort. This emphasis aligns with research on technology adoption showing that teachers embrace tools that demonstrably reduce workload while maintaining instructional quality (Tondeur et al., 2017).

However, this efficiency focus also raises important considerations. While time-saving is valuable, teachers must maintain critical evaluation of AI-generated content for accuracy, cultural appropriateness, and pedagogical effectiveness. Future support should help teachers balance efficiency with quality, viewing AI as a collaborator in design processes rather than an automated solution requiring no professional judgment.

Limited Pedagogical Articulation Indicates Need for Ongoing Support

While teachers demonstrated high technical confidence, their generic responses about implementation plans ("I will use it as teaching media") suggest limited articulation of specific pedagogical strategies. Only a few teachers mentioned concrete applications like pronunciation practice or intonation instruction. This gap between technical confidence and pedagogical imagination indicates that deeper understanding requires time for reflection, experimentation, and iterative refinement (Kopcha, 2012).

Moving forward, teachers would benefit from concrete lesson plan examples, collaborative design opportunities, and frameworks for aligning AI use with learning objectives. As Voogt et al., (2013) emphasize, sustainable technology integration requires ongoing professional learning communities where teachers can share practices, solve problems collectively, and develop context-appropriate implementation strategies.

Pathways to Sustainable Implementation

The positive response to training provides favorable conditions for sustainable integration at SMPN 1 Jongkat. However, sustaining momentum requires ongoing technical support, peer collaboration networks, and administrative commitment to providing necessary infrastructure and time allocation (Ertmer et al., 2012). A gradual implementation approach, allowing teachers to start with small experiments and progressively expand AI use, supports sustainable adoption better than expectations for immediate comprehensive transformation.

Establishing mentoring programs, developing contextual lesson plan repositories, conducting follow-up

workshops, and monitoring student learning outcomes will help translate initial confidence into effective classroom practice. As Richardson (2009) notes, technology integration is not a single event but an ongoing process requiring continued attention, support, and refinement.

Conclusion

The technology integration training at SMPN 1 Jongkat successfully built teachers' confidence in using Google AI Studio for English pronunciation instruction, with particularly strong confidence in practical applications like listening input and speaking activities. Teachers clearly recognized efficiency advantages in material development. However, opportunities exist to strengthen self-assessment capabilities, deepen pedagogical understanding, and provide ongoing support for translating confidence into effective practice. With sustained institutional commitment and continued professional development, SMPN 1 Jongkat is well-positioned to become a model for technology-enhanced language teaching in the region.

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